Rocky Flats
Environmental Technology Site
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REVISION 1
BULK CHEMICAL HANDLING, TRANSFER, AND STORAGE, OPERABLE UNIT 1, BUILDING 891

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1. PURPOSE

This procedure provides operating instructions for bulk chemical handling, transfer, and storage for the Building 891 Groundwater Treatment Facility for 881 Hillside, Operable Unit 1 at the Rocky Flats Environmental Technology Site.

2. SCOPE

This procedure applies to all Environmental Operations Management employees and subcontractors.

This procedure addresses truck dock operations for receiving:

- Hydrochloric Acid (HCl)
- Sodium Hydroxide (NaOH)
- Decontamination Pad Water

3. OVERVIEW

The Building 891 Groundwater Treatment Facility consists of a groundwater recovery and storage system, an ultraviolet/hydrogen peroxide oxidation system, an ion exchange system with units for acid and caustic regeneration of resin, a spent regenerant neutralization system, and a treated effluent storage and discharge system.

3.1 Hydrochloric Acid

Thirty-five percent HCl for regeneration of ion exchange resins and the neutralization of regeneration waste is stored at the Building 891 Groundwater Treatment Facility. Tank T-209 is a 2,500-gal acid storage tank.

3.2 Sodium Hydroxide

Fifty percent NaOH for the regeneration of ion exchange resins and neutralization of regeneration waste is stored at the Building 891 Groundwater Treatment Facility. Tank T-208 is a 1,250-gal NaOH storage tank.

3.3 Decontamination Pad /Environmental Restoration Incidental Water

Decontamination water from the Main Decontamination Facility (Decon Pad) and other Environmental Restoration (ER) incidental water is received at the Building 891 Groundwater Treatment Facility for treatment. The decontamination water is sampled before the tanker leaves the Decon Pad, and results of analysis are sent to the Project Manager who assesses the results in accordance with the Preliminary Plan for Future Utilization of Existing Water Treatment Facilities at the Rocky Flats Plant. Upon authorization from the Project Manager, the tanker is delivered to the Building 891 Groundwater Treatment Facility.

4. LIMITATIONS AND PRECAUTIONS

- The tanks associated with the bulk chemical storage system are confined spaces. Any entry to the tanks shall be in accordance with Rocky Flats procedures and the Sitewide Water Treatment Facility (STF) Plan.

- The bulk chemical storage systems contain concentrated acid and base solutions for regeneration of the ion exchange columns. Use and handling of the materials shall be in accordance with the requirements of the Sitewide Water Treatment Facility (STF) Plan.

5. RESPONSIBILITIES

5.1 Operator

Handles the transfer of acid and caustic used in the treatment system and the transfer of decontamination pad cleaning water to the appropriate facility storage tank.

5.2 Project Manager

Orders makeup HCl and NaOH.

Ensures that all personnel, including subcontractors, are trained and qualified to perform the duties, tasks, and responsibilities described in this procedure.

Ensures that project records are handled appropriately.

6. PREREQUISITES

6.1 Planning and Coordination

Project Manager

[1] Ensure that all personnel involved in the field implementation of this procedure have the appropriate health and safety training as specified in the Sitewide Water Treatment Facility (STF) Plan.

[2] Ensure that all personnel involved in the field implementation of this procedure have the appropriate Personnel Protective Equipment as specified in the STF.

[3] Document personnel qualifications related to this procedure in the project files in accordance with 3-21000-ADM-02.01, Training and 3-21000-ADM-02.02, Personnel Qualification.

[4] Obtain make-up chemicals using the following:

[A] Calculate the volume of HCl or NaOH remaining in the tank using the Bulk Chemical Ordering Calculation Sheet, Appendix 1, and the conversion tables maintained at the Sitewide Water Treatment Facility (STF) Plan before ordering makeup HCl or NaOH.

[B] Order makeup HCl or NaOH from the chemical supplier at least two days before the delivery of acid..

[C] Notify chemical supplier that the tanker must stop at the on-site Shipping and Receiving office to be weighed prior to delivery at Building 891.

[D] Notify Security and the Project Manager two days before the delivery.

[E] Notify the on-site Weather office of the anticipated delivery 2 days before the delivery.

[F] Notify the on-site Shipping and Receiving office of the anticipated delivery 2 days before the delivery.

[G] **WHEN** the tanker arrives,
THEN direct the driver to park the truck in the truck dock or spill containment area.

6.1 Planning and Coordination (continued)

[H] Complete a Bulk Chemical Receiving Checklist, Appendix 2, before starting transfer of HCl or NaOH.

[5] Prepare to receive Decontamination Pad/ER Incidental Water using the following:

[A] **WHEN** the tanker arrives,
THEN direct the driver to park the truck in the truck dock or spill containment area.

[B] Complete a Decontamination Pad/ER Incidental Water Receiving Checklist, Appendix 3, before starting transfer of water.

[6] Review analytical results and verify acceptability of shipment.

7. INSTRUCTIONS

Acid and caustic used in the treatment system, and decontamination pad cleaning water are delivered by tanker truck, and transferred into the appropriate facility storage tank.

7.1 Truck Dock Operation—Receiving Hydrochloric Acid

Project Manager and Operator

[1] Document all activities on the Daily Log in accordance with 2-G18-ER-ADM-17.01, Records Capture and Transmittal.

Project Manager

[2] Verify that all prerequisites in Section 6, Prerequisites, have been completed, and record on Daily Log.

Operator

[3] Verify that the tanker wheels are chocked.

[4] Complete the Bulk Chemical Receiving Checklist as steps are completed.

[5] Verify, by reviewing the shipment manifest, that the tanker contains 35% HCl.

[6] Ensure that the tanker is properly connected to the ACID INFLUENT flange.

The ACID INFLUENT flange is on the outside of the north wall of Building 891. The delivery truck driver uses hoses provided with the delivery truck to make the connections.

[7] Open HVA-209, Acid Inlet - Truck Dock.

HVA-209 is on the ACID INFLUENT line inside of Building 891 along the north wall.

[8] Monitor the level of Tank T-209 on local readout or Allen Bradley screen as HCl is being transferred into Tank T-209.

7.1 **Truck Dock Operation—Receiving Hydrochloric Acid (continued)**

The delivery driver is responsible for pumping the HCl from the tanker truck to the facility piping.

NOTE 1 *Visual and audible alarms activate when high level, 4 ft 5 in. and high-high level, 4 ft 11 in. are reached in Tank T-209.*

NOTE 2 *The Project Manager can authorize filling T-209 to the high-high level.*

[9] **IF** the high level alarm is reached,
THEN notify the driver to stop the transfer of the chemical.

[10] Discontinue filling Tank T-209 before the high level, 4 ft 5 in., is reached.

[11] **AFTER** the delivery truck driver has blown-down the transfer hoses,
THEN:

[A] Close HVA-209.

[B] Disconnect the transfer hoses.

[C] Install end caps on all hose connections.

[D] Record the level Tank T-209 in the Daily Log and on the Bulk Chemical Receiving Checklist.

[E] Complete the Bulk Chemical Receiving Checklist.

[F] Inspect truck dock for evidence of leaks and spills.

[12] **IF** a spill has occurred,
THEN notify the Project Manager and follow the response steps in accordance with Standing Order 24, Site Wide Spill Response.

[13] Call X2911 for life threatening emergencies.

7.2 Truck Dock Operation—Receiving Sodium Hydroxide

Project Manager and Operator

[1] Document all activities on the Daily Log in accordance with 2-G18-ER-ADM-17.01, Records Capture and Transmittal.

Project Manager

[2] Verify that all prerequisites in Section 6, Prerequisites have been completed, and record on Daily Log.

Operator

[3] Verify that the tanker wheels are chocked.

[4] Verify, by reviewing the shipment manifest, that the tanker contains NaOH.

[5] Complete the Bulk Chemical Receiving Checklist as Steps are completed.

[6] Ensure that the tanker is properly connected to the CAUSTIC INFLUENT camlock.

The CAUSTIC INFLUENT camlock is on the outside of the north wall of Building 891 along the north wall.

[7] Open HVA-208, Caustic Inlet - Truck Dock.

The caustic influent or isolation valve is on the CAUSTIC INFLUENT line on the inside of Building 891 along the north wall.

[8] Monitor the level of Tank T-208 on local readout or Allen Bradley screen as NaOH is being transferred into Tank T-208.

7.2 Truck Dock Operation—Receiving Sodium Hydroxide (continued)

The delivery driver is responsible for pumping the NaOH from the tanker truck to the facility piping.

NOTE 1 *Visual and audible alarms activate when high level, 4 ft 5 in. and high-high level, 4 ft 11 in. are reached in Tank T-208.*

NOTE 2 *The Project Manager can authorize filling T-208 to the high-high level.*

[9] **IF** the high level alarm is reached,
THEN notify the driver to stop the transfer of the chemical.

[10] Discontinue filling Tank T-208 before the high level, 4 ft 5 in., is reached.

[11] **AFTER** the delivery truck driver has blown-down the transfer hoses,
THEN:

[A] Close HVA-208.

[B] Disconnect the transfer hoses.

[C] Install end caps on all hose connections.

[D] Record the level of Tank T-208 in the Daily Log and on the Bulk Chemical Receiving Checklist.

[E] Complete Bulk Chemical Receiving Checklist.

[F] Inspect truck dock for evidence of leaks and spills.

[12] **IF** a spill has occurred,
THEN notify the Project Manager and follow the response steps in accordance with Standing Order 24, Site Wide Spill Response.

[13] Call X2911 for life threatening emergencies.

7.3 Truck Dock Operation—Receiving Decontamination Pad/ER Incidental Water

Project Manager and Operator

[1] Document all activities on the Daily Log in accordance with 2-G18-ER-ADM-17.01, Records Capture and Transmittal.

Project Manager

[2] Verify that all prerequisites in Section 6, Prerequisites have been completed, and record on Daily Log.

Operator

[3] Complete the Decontamination Pad Water Receiving Checklist as steps are completed.

[4] Verify that the tanker wheels are chocked.

CAUTION

An adequate capacity to receive the water in the tanker truck is required for the chosen Influent Storage tank to avoid the potential for damage to the surrounding area.

[5] Ensure that the chosen Influent Storage Tank has adequate capacity to receive the water in the tanker truck.

[6] **IF** transferring decontamination pad /ER incidental water to Influent Storage Tank T-201,
THEN open HVA-201, Influent from French Drain to T-201, and close HVA-202, Influent from French Drain to T-202.

[7] **IF** transferring decontamination pad /ER incidental water to Influent Storage Tank T-202,
THEN open HVA-202, and close HVA-201.

[8] Connect the pump discharge hose to the Building 891 pipe connection labeled INFLUENT TO TANKS 201 OR 202, and to the pump discharge outlet.

[9] Connect the pump suction hose to the tanker discharge line, and to the pump suction inlet.

[10] Open V-103, Truck Dock Influent.

7.3 **Truck Dock Operation—Receiving Decontamination Pad/ER Incidental Water (continued)**

V-103 is on the north wall of Building 891.

[11] Open the tanker vent valve.

[12] Open the discharge valve on the tanker.

[13] Start the pump, and begin the transfer of water from the truck to the Influent Storage tank.

[14] Monitor the level of the selected Influent Storage tank on the Allen-Bradley screen in the Motor Control Room.

[15] **IF** the pump is **NOT** equipped with an automatic shut off,
THEN monitor the pump during transfer.

[16] **IF** the pump begins to cavitate,
THEN immediately shut the pump OFF.

[17] **WHEN** the tanker is empty,
THEN close the following:

- Tanker discharge valve
- Vent valve
- V-103

[18] Disconnect the pump suction and discharge hoses, and catch any water that drains out of the hoses in a bucket.

[19] Pour the water into the building sump inside of Building 891.

[20] Notify the Building 374 Evaporator Supervisor that the tanker is empty and available for further use.

[21] Record the transfer activities in the Daily Log.

8. RECORDS

Management of all records is consistent with 1-77000-RM-001, Records Management Guidance for Records Sources.

Project Manager

[1] Ensure that the original and one copy of the following quality related records, as appropriate, are transmitted to the ERPD Project File Center in accordance with 2-G18-ER-ADM-17.01.

- Bulk Chemical Ordering Calculation Sheet
- Bulk Chemical Receiving Checklist
- Decontamination Pad /ER Incidental Water Receiving Checklist
- Daily Log

Submission of record copies to the ERPD File Center satisfies Administrative Record requirements as defined in 3-21000-ADM-17.02, Administrative Records Screening and Processing.

There are no nonquality records generated by this procedure.

9. REFERENCES

Sitewide Water Treatment Facility (STF) Plan

Standing Order 24, Site Wide Spill Response

1-77000-RM-001, Records Management Guidance for Record Sources

2-G18-ER-ADM-17.01, Records Capture and Transmittal

3-21000-ADM-02.01, Training

3-21000-ADM-02.02, Personnel Qualification

3-21000-ADM-17.02, Administrative Records Screening and Processing

APPENDIX 1
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BULK CHEMICAL ORDERING CALCULATION SHEET

CHEMICAL BEING ORDERED: HCl (TANK T-209) or NaOH (TANK T-208)
DATE: _____

HCl: ACID TANK (T-209) LEVEL AND QUANTITY TO BE ORDERED

Volume of HCl Tank (T-209) at the 4'-5" high level = 2050 gallons

Liquid Level in tank = _____ feet
Gallons of product remaining in tank = _____ gallons (refer to the volume depth table)

Working volume of HCl tank (at the 4'-5" high level less 10% = 2050 gallons - 205 gallons = 1845 gallons
Gallons of HCl to order = 1845 gallons - _____ gallons of product remaining in tank
Gallons of HCl to order = _____ gallons (which also equals the volume available in the tank)

Pounds HCl to Order = Gallons of HCl to order x 8.34 lbs/gallon x Specific Gravity a/
Pounds HCl to Order = _____ gallons x 8.34 lbs/gallon x _____(Specific Gravity)
Pounds HCl to Order = _____ pounds

NaOH: CAUSTIC TANK (T-208) LEVEL AND QUANTITY TO BE ORDERED

Volume of NaOH Tank (T-208) at the 4'-5" high level = 1029 gallons

Liquid Level in tank = _____ feet
Gallons of product remaining in tank = _____ gallons (refer to the volume versus depth table)

Working volume of NaOH tank (at the 4'-5" high level less 10%) = 1029 gallons - 103 gallons = 926 gallons

Gallons NaOH to order = 926 gallons - _____ gallons of product remaining in tank
Gallons NaOH to order = _____ gallons (which also equals the volume available in the tank

Pounds NaOH to Order = Gallons of NaOH to order x 8.34 lbs/gallon x Specific Gravity b/
Pounds NaOH to Order = _____ gallons x 8.34 lbs/gallon x 1.53
Pounds NaOH to Order = _____ pounds

a/ HCl: 22.0 Baume; Specific Gravity = 1.1789 at 15.6 degrees C
22.5 Baume, Specific Gravity = 1.1836 at 15.6 degrees C
22.6 Baume, Specific Gravity = 1.1846 at 15.6 degrees C
b/ NaOH: 50% Solution; Specific Gravity = 1.53 at 60 degrees F

Foreman Signature/Personnel Number:_____Date _____

Building Manager Signature/Personnel Number: _____Date_____

APPENDIX 2
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BULK CHEMICAL RECEIVING CHECKLIST

Form FO.38B
REV. 2
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CHEMICAL BEING DELIVERED: HCl (TANK T-209) or NaOH (TANK T-208)
DATE: _____
TIME: _____

1. Names of Plant Personnel Present During Delivery

Foreman:	Personnel Number:
Other:	Personnel Number:
Other:	Personnel Number:
Other:	Personnel Number:

2. Tanker Truck Arrival (Refer to Note a/

Is the trailer part of the truck parked in spill containment area?	Yes No
Are the wheel chocks in place?	Yes No
Are the Caution-Do Not Enter signs in place?	Yes No

3. Quantity Being Delivered

Complete page 2 of this checklist	Yes No
Pounds Ordered = _____ Gallons Ordered = _____ (refer to Bulk Chemical Ordering Calculation Sheet)	
Volume Available in the tank = _____ (refer to Bulk Chemical Ordering Calculation Sheet)	
Gallons being delivered as calculated from Delivery Ticker = _____ (refer to page 2 of this checklist)	
Gallons being delivered as calculated from On-Site Weight Ticket = _____(refer to page 2 of this checklist	
Is the volume available in the tank equal to or greater than the gallons ordered?	Yes No
Is the tanker Delivery Ticket quantity within 50 gallons of the quantity ordered?	Yes No
Is the tanker Delivery Ticket quantity within 50 gallons of the On-Site Weight Ticket quantity?	Yes No

4. Delivery Operation

Are adequate radio communications available?	Yes No
Is the tank level indicator system functioning properly?	Yes No
Is the truck's discharge hose connected to the proper tank fill line?	Yes No
Have the valves to the tanks been checked to ensure that the valves are in the proper position?	Yes No
Are routine checks being made during the transfer operation?	Yes No
Bulk Tanker pressure prior to transfer = _____ Bulk Tanker pressure during transfer = _____ _____ _____ _____ Bulk Tanker pressure during line purge = _____ _____ _____ _____	

5. After Delivery

At the end of the delivery, have all materials and valves been returned to the proper positions?	Yes No
Has the area been inspected for spills and is the area spill-free?	Yes No
Have the end caps been placed back on the proper line valves?	Yes No
Tank level after transfer = _____ feet. Quantity of product in tank after transfer _____ gallons	

Foreman Signature/Personnel Number: _____ Date_____
Building Manager Signature/Personnel Number: _____ Date_____

a/ If the answer to any question is "NO," discuss the situation with the Building Manager. The situation should be clearly understood and resolved before proceeding

APPENDIX 2
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Form FO.38B
REV. 2
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CHEMICAL BEING DELIVERED: HCl(TANK T-209) or NaOH (TANK T-208)
DATE: _____ AMBIENT AIR PRESSURE: _____
TIME: _____ AMBIENT AIR TEMPERATURE: _____

ON-SITE WEIGHT TICKET	
Gross Weight (total tanker weight)_____	pounds (use the on-site weight ticket)
- Tare Weight (weight of empty tanker) _____	pounds (use the tare weight from tanker delivery ticket)
= Net Weight (delivery amount) _____	pounds
HCl (refer to delivery ticket): Baume = _____	Specific Gravity = _____ a/
NaOH (refer to delivery ticket): % = _____	Specific Gravity = _____ b/
Gallons being delivered = Net Weight	in pounds / (8.34 pounds/gallon x Specific Gravity)
Gallons being delivered = _____	lbs / (8.34 lbs/gallon x _____)
Gallons being delivered = _____	gallons

TANKER DELIVERY TICKET	
Gross Weight (total tanker weight) _____	pounds
- Tare Weight (weight of empty tanker) _____	pounds
= Net Weight (delivery amount) _____	pounds
HCl Delivery: Baume = _____	Specific Gravity = _____ a/
NaOH: % = _____	Specific Gravity = _____ b/
Gallons being delivered = Net Weight	in pounds / (8.34 pounds/gallon x Specific Gravity)
Gallons being delivered = _____	lbs / (8.34 lbs/gallon x _____)
Gallons being delivered = _____	gallons

DIFFERENCES BETWEEN THE ON-SITE WEIGHT TICKET AND THE TANKER DELIVERY TICKET	
Gallons as shown in A. _____	gallons
- Gallons as shown in B. _____	gallons
= Difference in Gallons _____	gallons

a/ HCl Delivery: 22.0 Baume; Specific Gravity = 1.1789 at 15.6 degrees C
22.5 Baume; Specific Gravity = 1.1836 at 15.6 degrees C
22.6 Baume; Specific Gravity = 1.1846 at 15.6 degrees C
b/ NaOH Delivery: 50% Solution; Specific Gravity = 1.53 at 60 degrees F

Foreman Signature/Personnel Number: _____ Date_____
Building Manager Signature/Personnel Number: _____ Date_____

APPENDIX 3
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DECONTAMINATION PAD/ER INCIDENTAL WATER RECEIVING CHECKLIST

DECONTAMINATION PAD WATER RECEIVING CHECKLIST	Form FO.38B REV. 1 Sheet 1 of 1
Name: _____	Date: _____
Function	**Initials**
Tanker wheels are chocked	
Transfer to T-201 ☐ Yes ☐ No	
Valve HVA-201 is OPEN	
Valve HVA-202 is CLOSED	
Transfer to T-202 ☐ Yes ☐ No	
Valve HVA-202 is OPEN	
Valve HVA-201 is CLOSED	
Influent Storage Tank Number _____ /Level _____	
Pump discharge hose is connected to influent tank	
Pump discharge hose is connected to pump discharge outlet	
Valve V-103 is OPEN	
Tanker vent valve is OPEN	
Discharge valve on tanker is OPEN	
Tanker discharge valve is CLOSED	
Tanker vent valve is CLOSED	
Valve V-103 is CLOSED	
Influent Storage Tank Number _____ /Level _____	